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STANDARD CHLORINE OF DELAWARE, INC.

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100392

April 20, 1989

Ms. Diane Wehner
Environmental Scientist
DNREC
715 Grantham Lane
New Castle, Delaware 19720

Dear Ms. Wehner:

In accordance with Paragraph 6 of the Consent Order between Standard Chlorine of Delaware, Inc. and the Delaware Department of Natural Resources and Environmental Control, we are hereby submitting the Fifth Quarterly Groundwater Monitoring Report.

Please feel free to contact me if you have any questions.

Sincerely,

Robert J. Touhey, P.E.
Assistant Vice President
Environmental Affairs

RJT/dab
Enclosures

cc: A. R. Sinibaldi
T. E. Pierson
B. V. Bowers

AR307747

QUARTERLY MONITORING REPORT
GROUND WATER RECOVERY OPERATIONS

STANDARD CHLORINE OF DELAWARE, INC.
DELAWARE CITY, DELAWARE

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20 April 1989

PREPARED BY

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WESTON

QUARTERLY MONITORING REPORT
GROUND WATER RECOVERY OPERATIONS

STANDARD CHLORINE OF DELAWARE, INC.
DELAWARE CITY, DELAWARE

In response to the 22 January 1988 Consent Order between the Delaware Department of Natural Resources and Environmental Control (DNREC) and Standard Chlorine of Delaware, Inc., this quarterly report has been prepared to document monthly withdrawal rates and contaminant recovery at the pumping wells; and quarterly sampling results and water level data for the recovery and monitor wells. The report also contains an evaluation of the effectiveness of the recovery system and recommendations to improve the system. Documentation presented in this report covers the quarterly period from January to March 1989.

EVALUATION OF THE RECOVERY SYSTEM

The average monthly withdrawal rates from recovery wells RW-1 through RW-4 are presented in Table 1. Recovery wells RW-1 and RW-4 pumped continuously for the quarter. Withdrawal rates at RW-1 and RW-4 ranged between 4.6 and 7.1 gpm.

As previously mentioned in the last quarterly report, the submersible pump in RW-2 was damaged and the well was shut-down on 22 December 1988. A replacement pump and water level control device for RW-2 were ordered during the first quarter of 1989 and installed in early April 1989. The pump in RW-2 remained inoperable during this quarter, however, as of April 1989 the pump was brought back into service. Based upon a satisfactory performance of the water level control device in RW-2, others will be installed in the remaining recovery wells.

In order to reactivate RW-3, the following actions which were outlined in the last quarterly report have been implemented:

- Replacement carbon steel well casing and monel screen for RW-3 have been delivered to the site this quarter. Replacement of the well components at RW-3 is scheduled to commence in the next quarterly period.

- A new pump and a water level control device have been purchased and will be installed immediately following completion of the well replacement program.

Ground water level data collected at the recovery and monitoring wells on 16 March 1989 were used to construct a water level contour map presented in Figure 1. This map represents actual water levels observed while the recovery wells RW-1 and RW-4 were pumping. A complete summary of these water level data is presented in Table 2.

Monthly concentrations of organics recovered at RW-1 and RW-4 are presented in Table 3. These data indicate that total organic concentrations recovered at the pumping wells are generally higher in RW-1 and RW-4 than contaminant concentrations reported from last quarter. For this quarter, the average monthly concentration of total benzene species at the recovery wells, RW-1 and RW-4, ranged from 44 to 61 ppm respectively, compared to 34 to 54 ppm for last quarter. A comparison of the March 1989 isoconcentration map of the total benzene species (Figure 2) with the December 1988 analytical data indicates a moderate increase in the ground water contaminant concentrations associated with RW-1 and RW-4. The 3 March 1989 analytical results are summarized in Table 4.

EVALUATION OF TW-6A

The feasibility of using monitor well TW-6A as a recovery well was evaluated this quarter. Following the repair of the bent casing at TW-6A, a submersible pump was installed in the well. Due to an undetermined obstruction immediately above the well screen, the submersible pump could not be lowered past the top of the well screen. This limitation in the depth of the pump setting restricts the water level drawdowns that can be obtained at the monitor well and the ultimate radius of influence achievable if this well is to be used as a pumping center. In light of the recent information obtained from TW-6A, this monitor well is not considered adequate for use as a recovery well. Similarly other on-site monitor wells with the same well construction specifications would be unsuitable as recovery wells. Because of the limitations associated with the existing monitor wells, Standard Chlorine is considering the possibility of installing a larger diameter recovery well in the vicinity of TW-6A, and has contacted several licensed well drillers to obtain bids.

This well would be designed to maximize available drawdown in the ground water system, thereby increasing the effectiveness of a recovery well at this location.

RECOMMENDATIONS

1. Proceed with replacement of the well casing and screen in RW-3 and reactivate this pumping well as soon as practical.

2. Observe the performance of the water level control device in RW-2 and determine whether to install these devices in the remaining recovery wells.

3. Consider the possibility of installing a larger diameter recovery well in the vicinity of TW-6A.

TABLE 1

AVERAGE MONTHLY WITHDRAWL RATES (GPM)
GROUNDWATER RECOVERY WELL SYSTEM

STANDARD CHLORINE OF DELAWARE, INC.

MONTH (1989)	RW-1	RW-2	RW-3	RW-4
January	5.4	PD = 31 days	PD = 31 days	6.3
February	4.9	PD = 28 days	PD = 28 days	7.1
March	4.6	PD = 31 days	PD = 31 days	5.5

PD - pump down

TABLE 2

GROUNDWATER LEVEL DATA
STANDARD CHLORINE OF DELAWARE, INC.
16 MARCH 1989

Location	Measuring Point Elevation (Ft. MSL)	Depth to Water (Ft.)	Groundwater Elevation (Ft. MSL)
TW-1	49.90	30.08	19.82
TW-2	56.10	39.17	16.93
TW-3	56.30	39.67	16.63
TW-4	55.00	39.58	15.42
TW-5	50.10	33.67	16.43
TW-6	50.70	34.58	16.12
TW-7	50.40	34.50	15.90
TW-8	52.20	37.00	15.20
TW-10	50.50	37.00	13.50
TW-22	51.62	37.50	14.12
TW-24	49.44	37.67	11.77
TW-25	49.44	35.75	13.69
TW-28	52.82	40.92	11.90
TW-30	52.29	39.08	13.21
TW-31	50.36	36.42	13.94
TW-49	55.71	46.75	8.96
TW-50	53.28	45.00	8.28
TW-60	46.44	36.33	10.11
TW-61	45.50	36.25	9.25
TW-62	48.92	39.92	9.00
TW-63	53.83	44.75	9.08
TW-64	53.48	42.50	10.98
RW-1	54.75	46.42	8.33
RW-2	52.99	43.42	9.57
RW-3	45.55	36.00	9.55
RW-4	48.08	39.17	8.91

TABLE 3

MONTHLY CONCENTRATIONS OF TOTAL BENZENE SPECIES (ppm)
GROUNDWATER RECOVERY WELLS

STANDARD CHLORINE OF DELAWARE, INC.

MONTH (1989)	RW-1	RW-2	RW-3	RW-4
January	47.29	*	*	44.02
February	35.09	*	*	35.09
March	57.90	*	*	61.28

* No samples collected - Pump Inoperable during sampling events.

TABLE 4

QUARTERLY SAMPLING RESULTS
MONITOR AND RECOVERY WELLS

STANDARD CHLORINE OF DELAWARE, INC.

3 MARCH 1989

Location	Total Benzene Species Concentrations (PPm)
TW-1	7.89
TW-2	1.28
TW-3	.37
TW-4	.48
TW-5	233.87
TW-6A	31.61
TW-7	26.27
TW-8	182.36
TW-10	122.00
TW-22	19.78
TW-24	85.66
TW-25	73.55
TW-28	*
TW-30	*
TW-31	117.46
TW-49	318.77
TW-50	290.74
RW-1	57.90
RW-2	**
RW-3	**
RW-4	61.28

* TW-30 and TW-28 have free organics.

** No samples collected - pump inoperable

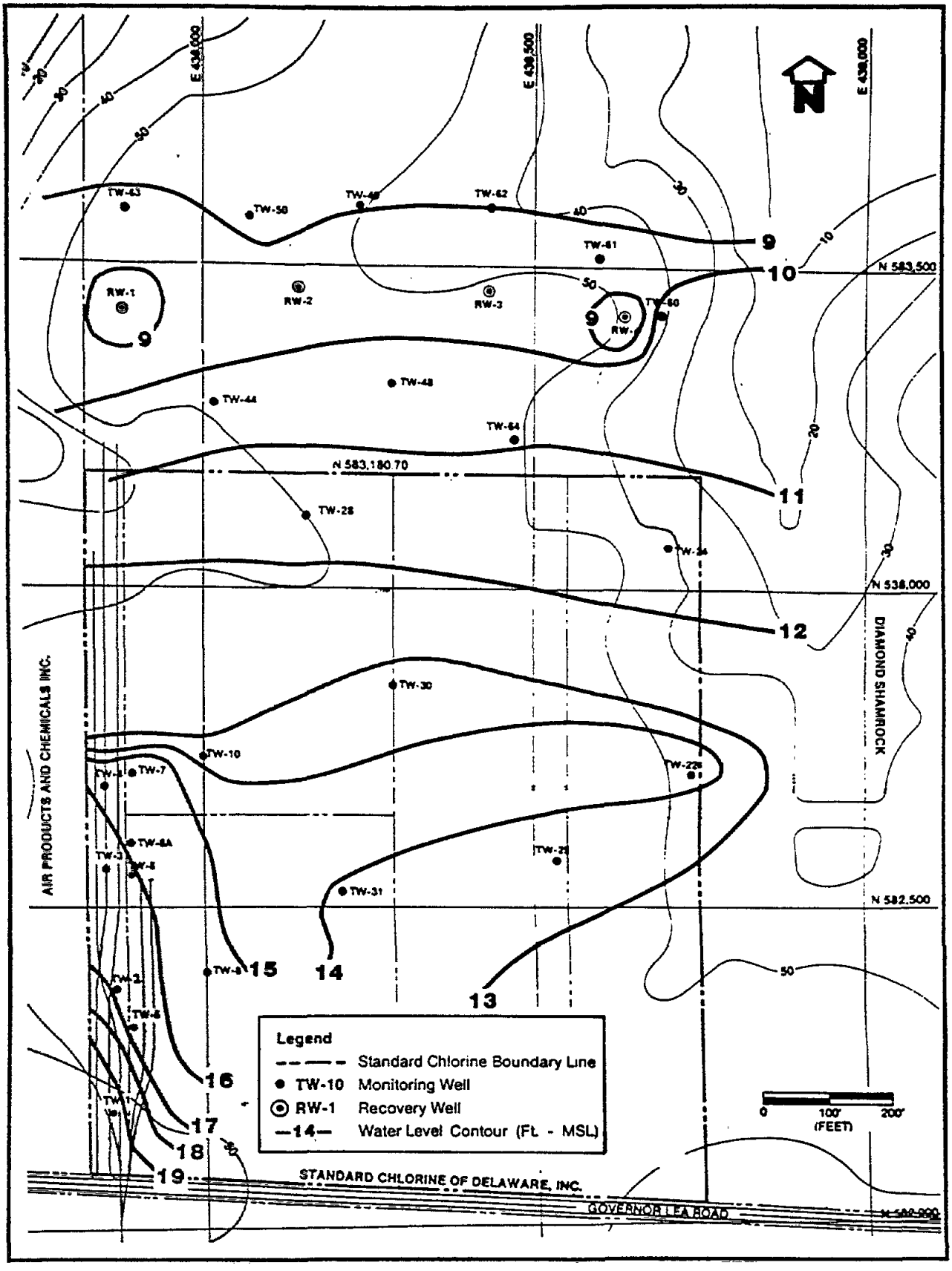

FIGURE 1 WATER LEVEL CONTOUR MAP - 16 MARCH 1989

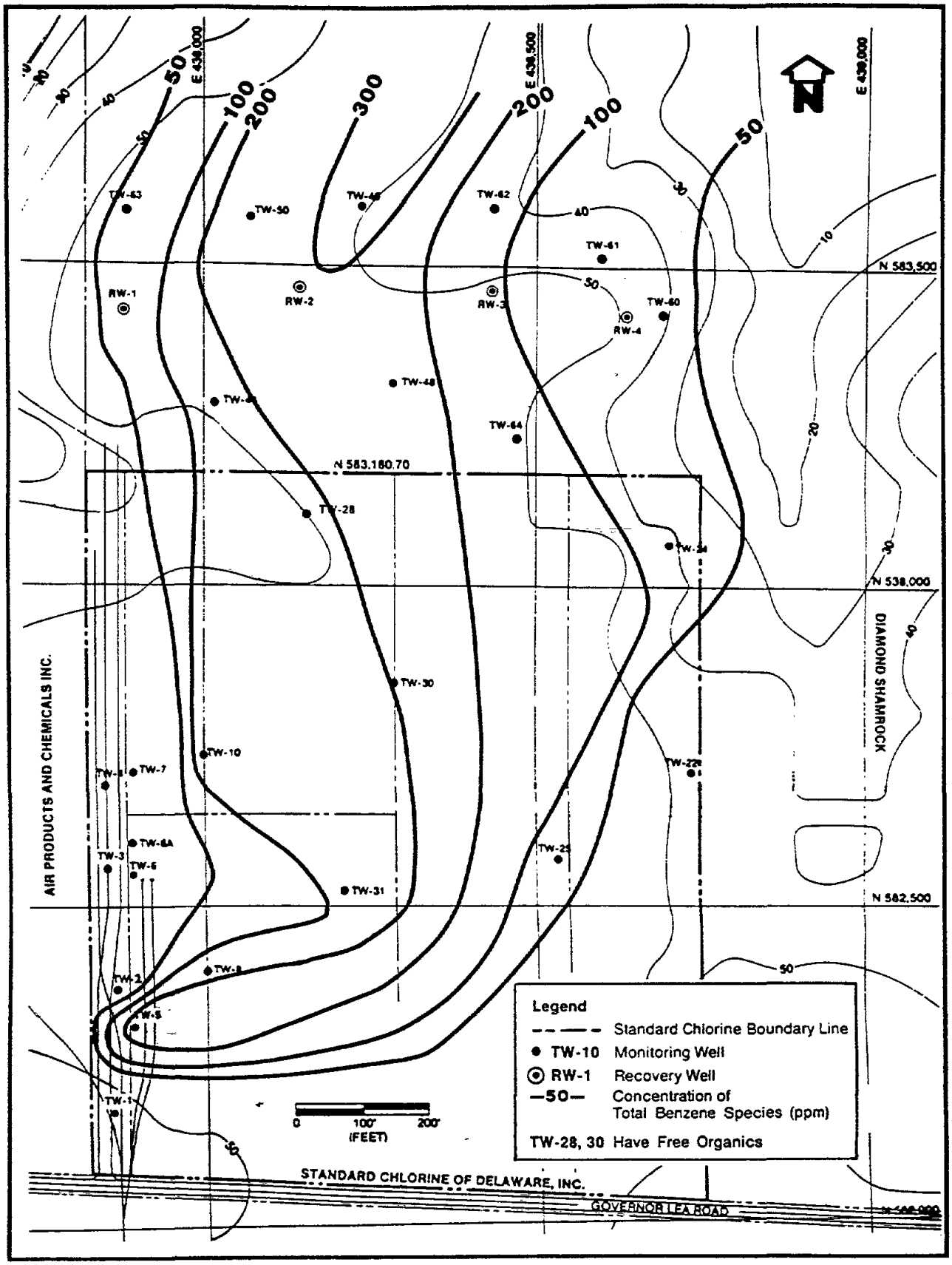

FIGURE 2 ISOCONCENTRATION MAP OF TOTAL BENZENE SPECIES, 3 MARCH 1989